# ENTOMOLOGICAL NEWS

**APRIL 1956**

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**CONTENTS**

Ross—New nearctic species of Erythroneura ..... 85

Edmunds—Exuviation of Ephemeroptera in flight ..... 91

Hull—Some new species of Bathypogon ..... 93

Muesebeck—Opius ferrugineus and two new species ..... 99

McConnell—Artificially feeding blood sucking insects ..... 103

Dillon—Neotropical Acanthocinini. Canidia and allies ..... 105

Entomological Departments
University of Connecticut ..... 107

Notes and News in Entomology
Corresponding Members of A. E. S. ..... 110
Society meeting ..... 111
Tenth International Congress at Montreal, 1956 ..... 111

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# ENTOMOLOGICAL NEWS

VOL. LXVII APRIL, 1956 No. 4

## New Nearctic Species of Erythroneura (Homoptera: Cicadellidae)

By HERBERT H. ROSS, Illinois Natural History Survey, Urbana, Illinois

During a study of the host relationships of the genus *Erythroneura* several species new to science were discovered and are herein described. Types are deposited in the collection of the Illinois Natural History Survey.

All these species belong to the *maculata* group, are of medium size for the genus, ranging from 2.8 to 3 mm., and have the more or less distinct, separate spots and short bars typical of most of the species in this group. These characteristics are not mentioned further in the descriptions. In the case of each species the diagnostic differences occur in the male genitalia.

**Erythroneura harpola** new species

The short, wide aedeagus indicates that the species belongs with *parallela* and its allies, from which it differs in the dorsal, out-curved spur of the pygofer hook.

Male genitalia as in fig. 1. Pygofer slender and having a dorsal, short, slender process arising some distance before the apex; this process also curves laterad. Style with long posterior point and inconspicuous anterior point; heel moderately sharp. Phalicata short, truncate at apex, the apical portion armed with minute spines, and the postero-ventral aspect wide and somewhat rectangular.

*Holotype* ♂.—Kinderhook, ILLINOIS, Aug. 9, 1951, on *Acer saccharum,* Richards and Stannard. *Paratypes.*—Same data, 1 ♂; Eddyville, Ill., Sept. 16, 1954, Mills and Ross, 1 ♂.

**Erythroneura glicilla** new species

This species is most closely related to *ingrata* Beamer, differing in the uniform thickness of the pygofer hook and the wider, more sinuate lateral flanges of the phalicata.

Male genitalia as in fig. 2. Pygofer hook extending a short distance beyond apex of pygofer, its lateral aspect of almost uniform thickness, the dorsal aspect moderately sinuate. Style as in *ingrata*, the posterior point long and slender, the heel projecting as a broad triangle. Phalicata forming only a gentle angle with base of aedeagus; lateral aspect slightly sinuate, with a dorsal lip at the extreme apex; ventral aspect with wide and smooth lateral flanges.

*Holotype* ♂.—Jonesboro, ILLINOIS, Je. 5, 1951, on *Carpinus caroliniana*, Ross and Richards.

**Erythroneura citrosa** new species

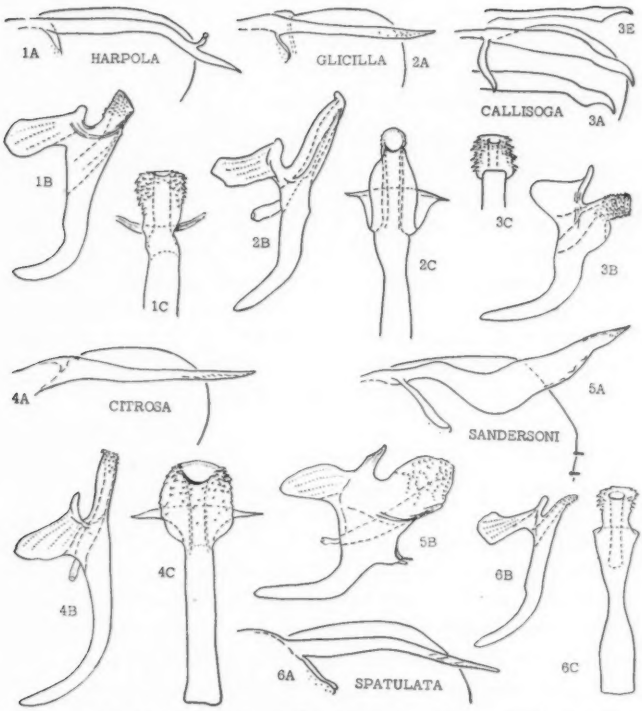
The long posterior point of the style and broad posterior aspect of the phalicata indicate that this species is most closely related to *parallela* McAtee, from which it differs in the elongate lateral aspect of the phalicata.

Male genitalia as in fig. 4. Pygofer hook extending a considerable distance beyond apex of pygofer, in lateral view slightly sinuate, in dorsal view moderately sinuate. Style with elongate posterior point and inconspicuous heel. Phalicata extending almost perpendicular to the base of the aedeagus; lateral aspect fairly long and narrow, with conspicuous small teeth at apex; ventral aspect wide and almost oval.

*Holotype* ♂.—Salem, ILLINOIS, Sept. 22, 1948, on *Corylus americana*, Ross and Stannard. *Paratypes*.—Same data, 1 ♂; Rocky Branch, Clark Co., Ill., Sept. 14, 1949, Stannard and Ross, 1 ♂; Galena, Ill., Sept. 6, 1951, Mills and Ross, 3 ♂; Galena, Ill., Jl. 10, 1934, DeLong and Ross, 2 ♂. All but the last collection from *Corylus americana*.

**Erythroneura callisoga** new species

The curiously irregular pygofer hook will distinguish this species from its closest allies which belong to the *parallela* complex.




FIGS. 1–6. Male genitalia of *Erythroncura*. *A*, pygofer hook, lateral aspect; *B*, *C*, aedeagus, lateral and posterior aspects; *D*, style; *E*, pygofer hook, dorsal aspect.

Male genitalia as in fig. 3. Pygofer hook moderately short; lateral aspect with basal portion deep, the apical third narrow and twisted ventrad; dorsal aspect with basal portion narrow and with a prominent widened area just before the tip. Style with long posterior point as in *parallela*. Phalicata short, projecting at a moderately sharp angle from base of aedeagus which is swollen to form a round shoulder immediately below the phalicata; lateral aspect of phalicata truncate and spiny, ventral aspect nearly as wide as long and with sharp spines along the edge of the lateral flange.

*Holotype* ♂.—Giant City State Park, ILLINOIS, Sept. 14, 1954, on *Acer saccharum,* Mills and Ross.

**Erythroneura spatulata** new species

Another close relative of *parallela,* this species is readily diagnosed by the narrow lateral aspect of the phalicata.

Male genitalia as in fig. 6. Pygofer hook fairly elongate, narrow, gradually tapering to apex, the dorsal aspect moderately sinuate. Style with long posterior point, almost exactly as in *parallela.* Aedeagus with very short phalicata, its lateral aspect very narrow, its posterior aspect wide and serrate.

*Holotype* ♂.—Rock Island, ILLINOIS, Jl. 7, 1934, DeLong and Ross. *Paratypes.*—Fox Ridge State Park, Ill., Je. 29, 1947, on *Carya,* Ross and Stannard, 4 ♂.

**Erythroneura norica** new species

This species probably approaches most closely *malaca* Knull, differing in the more massive foot of the style and the evenly tapering pygofer hook.

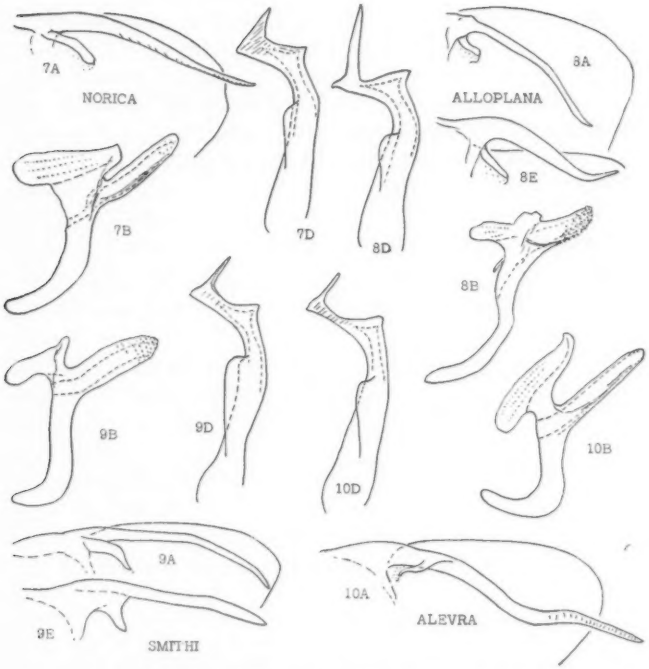
Male genitalia as in fig. 7. Pygofer hook elongate, the lateral aspect tapering evenly from a stout base to a narrow apex, dorsal aspect evenly and gently sinuate. Style with massive foot and triangular posterior point. Phalicata moderately long, slightly deeper than wide, with only minute lateral teeth, with a pair of narrow lateral flanges, and set at a slight angle from the base of the aedeagus.

*Holotype* ♂.—Forest City, ILLINOIS, Sept. 11, 1951, on *Quercus marilandica,* Stannard and Ross. *Paratypes.*—Same data, 23 ♂; same data but Sept. 8, 1954, 2 ♂.

**Erythroneura alloplana** new species

A close relative of *parva* Beamer, this species differs in the stouter phalicata and shape of the pygofer hook.

Male genitalia as in fig. 8. Pygofer hook short, the lateral aspect narrow and slightly angled, the dorsal aspect wide, tapering sharply to apex, extreme apex curved mesad. Style with very long posterior point and small, angular anterior point.




FIGS. 7–10. Male genitalia of *Erythroneura*. Abbreviations as for figs. 1–6.

Phalicata short, spinose at apex, the lateral aspect stocky, the posterior aspect with wide basal flanges, the entire structure situated at the dorsal extremity of the aedeagal base.

*Holotype* ♂.—Forest City, ILLINOIS, Sept. 11, 1953, on *Quercus marilandica,* Stannard and Ross. *Paratypes.*—Same data, 2 ♂; same but Sept. 8, 1954, 2 ♂; Meredosia, Ill., Oct. 2, 1951, on *Quercus marilandica,* Sanderson and Stannard, 1 ♂; Marshall, Ill., Sept. 27, 1934, Frison and Ross, 1 ♂.

**Erythroneura alevra** new species

Closely related to *externa* Beamer, this species differs in the long posterior point and the narrow phalicata.

Male genitalia as in fig. 10. Pygofer hook extended beyond pygofer, in lateral view of almost even thickness, in dorsal view sickle-shaped. Foot with moderately long and slender posterior point. Phalicata slightly deeper than wide, has fairly wide basal flange, but few spicules.

*Holotype* ♂.—Mt. Vernon, ILLINOIS, Sept. 1, 1950, on *Quercus alba,* Ross and Evers.

**Erythroneura sandersoni** new species

The curious tubercles beneath the phalicata separate this species from *spinea* Knull, the only species to which this appears closely related.

Male genitalia as in fig. 5. Pygofer hook with a slender base and greatly expanded apical position, irregular in outline. Foot with very long posterior point. Phalicata massive but short, with wide basal flange; beneath the phalicata the aedeagal base has a wide prominence bearing a pair of bag-like processes.

*Holotype* ♂.—Elizabethtown, ILLINOIS, Jl. 27, 1951, on *Acer,* Richards and Sanderson. *Paratype.*—Giant City State Park, Ill., Jl. 16, 1954, on *Acer saccharum,* Stannard and Ross, 1 ♂.

**Erythroneura smithi** new species

This species appears closest to *malaca* Knull, but differs in the ribbon-like pygofer hooks and narrow posterior point.

Male genitalia as in fig. 9. Pygofer hook elongate, slightly angled at middle, the dorsal aspect wider than the lateral. Posterior point nearly as long as the foot, straight and slender. Phalicata much deeper than wide, without flanges but with small spicules toward apex.

*Holotype* ♂.—Meredosia, ILLINOIS, Sept. 8, 1954, on *Quercus marilandica,* Ross and Stannard. *Paratypes.*—Same data, 2 ♂; Christopher, Ill., Aug. 5, 1954, on *Q. marilandica,* Ross and Moore, 1 ♂.

# Exuviation of Subimaginal Ephemeroptera in Flight [1]

By George F. Edmunds, Jr., University of Utah

Before the nuptial flight takes place the unique subimaginal stage of the Ephemeroptera must exuviate to become an imago. However, there are some exceptional forms in which this final exuviation does not occur. In *Plethogenesia* both males and females mate and die as subimagos; while in some other examples, only the male molts to become an imago, as in *Ephoron* and *Tortopus*. The subimaginal stage may last as little as five minutes, in which case it is rather remarkable in that the insect must exuviate twice within a five-minute period. Usually the exuviation of the subimago takes place with the insect resting upon vegetation or the walls of buildings, but some forms exuviate in flight.

McLachlan (1880; Ent. Mon. Mag.) and Grandi (1947; Boll. Ist. Ent. Univ. Bologna, 16: 215) have observed exuviation in flight in *Oligoneuriella rhenana* (Imhoff), and Edmunds (1951; Proc. Ent. Soc. Wash., 53: 330) has reported on the same phenomenon in the life of *Lachlania powelli* Edmunds. Both of these mayflies belong to the remarkable family Oligoneuriidae in which the subimaginal skin is shed from all parts of the body *except the wings*. It is therefore only a partial exuviation and is apparently a special adaptation which allows the exuvium to be shed without interrupting the flight. In the one oligoneuriid, *Lachlania*, that I have observed in its nuptial flight, the mayflies never stopped flying from the time of emergence from the nymphal stage until they dropped to the water in a spent condition more than three hours later. At no time was any individual seen to alight—in fact when specimens were knocked to the ground in my attempt to net them they were unable to get back into the air. It is highly probable that all of the subfamily Oligoneuriinae of the Oligoneuriidae have a partial exuviation in flight, but this may not be true of the Pseudoligoneuriinae (*Pseudoligoneuria* and/or *Chromarcys*).

[1] This research was supported by a financial grant from the University Utah Research Fund.

Burks (1953; Bull. Ill. Nat. Hist. Surv., 26 (Art. 1): 7, 33, 45–47) has now reported exuviation in flight for four additional genera of mayflies that are not members of the Oligoneuriidae, *Ephoron* (Polymitarcidae, Polymitarcinae), *Tortopus* (Polymitarcidae, Campsurinae), *Caenis* (Caenidae), and *Tricorythodes* (Tricorythidae). The males of *Ephoron* and *Tortopus* and both males and females of *Tricorythodes* shed the subimaginal exuvium from all parts of the body, *including the wings.* This is true also in both sexes of *Caenis* except that the pellicle is retained on the tails. Thus it is obvious that if exuviation takes place in flight the mayfly must stop flying during the time the wings are being pulled free of the subimaginal exuvium. Presumably the insect would have to get high enough in the air to undergo a period of free fall while the wings are freed from the subimaginal pellicle.

Burks (loc. cit.) does not state whether his observations on the males of *Ephoron* apply to *E. album* (Say), *E. leukon* Williamson, or to both. In studying *Ephoron album* in Utah, Edmunds, Nielsen, and Larsen (1956; Wasmann Jour. Biol., in press) found that the male subimago alights for a period of 50 to 80 seconds to shed the subimaginal skin.

The only species of *Caenis* known to occur in Utah appears to be conspecific with the typical *Caenis simulans* McDunnough, which is the species Burks observed in Illinois. On June 30, 1954, I made a field trip to Haynes Lake near Salt Lake City for the purpose of observing subimaginal exuviation in *Caenis simulans.* I was unable to observe any case of exuviation in flight but was able to observe hundreds of specimens of both sexes of *Caenis simulans* exuviating while at rest. The leeward side of my automobile was nearly covered with the cast exuvia.

The difficulty of shedding the exuvium from the wings in flight and my own observations of *Ephoron album* and *Caenis simulans* exuviating while at rest lead me to suspect that Dr. Burks might have been deceived by mayflies dropping the exuvium in flight only after the major part of exuviation had taken place while the mayflies were at rest. Lyman (1955; Ann. Ent. Soc. Amer., 48: 389) has come to a similar con-

clusion from his observations on the exuviation of *Caenis simulans* in Michigan. The males of *Ephoron album* usually fly from their resting place as soon as the wings are free and the cast exuvium is carried into the air where it may continue to cling to the cerci for a minute or two. Thus it is often that one sees the cast skin dropped from the insect in flight. Although I have not observed this in *Caenis simulans,* Lyman (1955: loc. cit.) has reported it, and I have seen the exuvia on the surface of a pond where they were dropped by the flying insects. I am unable to comment on the subimaginal exuviation of *Tortopus* and *Tricorythodes,* but additional observations on these two genera are desirable to determine with greater certainty the method of exuviation of the subimago.

## Some New Species of Bathypogon (Diptera: Asilidae)

By Frank Montgomery Hull, University of Mississippi

The flies of the genus *Bathypogon* Loew are characteristic members of the dipterous fauna of southern South America and especially of Australia. The following new species are described from material collected by the author in Australia in 1953–54.

**Bathypogon rubellus** n. sp.

Medium sized species characterized by the black bristles of upper occiput, front and vertex. The face is orange yellow, with pale bristles and yellow pubescence. The first two antennal segments and the base of the third segment are yellowish. Mesonotum dark, with the humeri and a wide lateral stripe orange brown. Thoracic and leg bristles black. Last four tergites of male brownish orange. Length 14–16 mm.

Male. *Head:* vertex and front black with orange brown pollen, its bristles and those of the upper third of the occiput black. The post vertical cluster is composed of seven bristles. Upper occipital pollen orange brown. Face light orange in

ground color, with yellow pubescence. The medial area of the face on the lower three-fourths is raised and set with stout, pale brown bristles. Enclosed sublaterally by a vertical row of more slender, brownish white bristles. The palpi and proboscis are black, the former with brownish bristles, the latter with white pile. Pile of the lower occiput white. The first two antennal segments are pale brownish orange, the first narrowly tipped with rust color. The third segment is comparatively short and swollen and brown with the base lighter.

*Thorax:* mesonotum black in ground color, except upon the humeri and the wide lateral margins, which are a light orange brown and overlaid with pale brownish yellow pollen. The pollen over the dark central area is a dark reddish to orange brown. The postcalli and a band in front of the scutellum are orange brown in ground color; this band is extended forward on either side as a narrow wedge covering the post dorsocentral bristles. The thoracic complement of bristles consists of: one posthumeral, two notopleurals, one supra-alar, two postcalli, two pairs of scutellars and five or six quite long, post dorsocentrals. Pleura chiefly brownish black with the lower propleura, the upper sternopleura, the pteropleura and post mesopleura and the metapleura orange brown in ground color, but the whole area thickly overlaid with deep brownish yellow pollen.

*Legs:* the femora are almost entirely black; the anterior pair have a small, short, reddish brown streak posteriorly at the apex and another at the base. The middle femora have a posterior and the hind femora have a medial streak of the same color, both quite narrow, indistinct but nearly complete. The tibiae and tarsi are comparatively light in color and are orange brown; the anterior tibiae are obscurely darker anteriorly, except at the base. The middle tibiae are similar and with the apex quite narrowly and diffusely blackish. Hind tibiae black laterally but dark reddish brown elsewhere. Claws brownish at base. Pile of legs brownish white; all bristles black.

*Wings:* distinctly tinged with pale brown, the apex darker and villose. All veins including the costa vein quite dark brown. Lower end vein of the discal cell two and a half times as long

as the upper vein (discal cross vein) and not quite aligned with the lower end vein of the fourth posterior cell.

*Abdomen:* first four tergites black; first three narrowly reddish on the lateral margins; fifth to eighth tergites brownish orange or red, and slightly darker posteriorly. The whole terminalia are brownish orange. Ventral plate without processes. Pile of the abdomen pale; bristles weak and also pale.

Female. Similar to the male. The tarsi and tibiae, while usually of the same color as the male, occasionally are darker; the narrow, obscure reddish streaks on the femora are usually absent, leaving these totally black. Hind tibiae usually entirely black. Abdomen everywhere quite black. The basal corner of the first and second tergite sometimes a little reddish. Abdominal pile white, the pollen brown dorsally, but quite thin, and viewed from above, it appears to be absent, except on the sides of the first four tergites, where it is greyish white. In an oblique light the first four tergites have thin brownish pollen.

*Type* male, and *allotype* female: 37 miles southeast of Perth, Brookton Highway, WEST AUSTRALIA, 6, 1, 1954, F. M. Hull collector. *Paratypes:* with the same data, 8 males and 9 females.

**Bathypogon uncinatus** n. sp.

A medium sized species. All the bristles of the head white except for two or three dark brown bristles on and opposite the ocellarium. Mesonotal bristles varying from yellowish brown to dark brown with the post dorsocentrals partly brownish black. Scutellars pale brownish yellow. Bristles of legs pale. First two antennal segments black, the third black except at base. Entire mesonotum black except the postcalli and humeri. Immediately characterized by the long, posteriorly protuberant, apically attenuate processes of the superior forceps. Ventral plate with hood-like processes. Length 15 mm.

Male. *Head:* black everywhere in ground color. The pollen of the occiput is greyish white; of the vertex, and of the front, except laterally, dark golden brown. Lateral, front and facial pollen pale greyish yellow, nearly white. Bristles of face brownish white. Palpal bristles white. Proboscis with an

unusually high dorsal ridge or keel. Antennae black, with the apex of the second segment and the narrow base of the third, obscurely brown.

*Thorax:* mesonotum black, including the whole lateral margin, except the humeri, which are chiefly reddish brown and become black anteriorly. There is an obscure, small, reddish brown spot ventrally on the postcalli which encloses the last bristle of the post dorsocentral row. The pollen of the mesonotum is rather light brown; viewed anteriorly there are two well defined black vittae, rather widely separated; viewed dorsally they are less widely separated. Pollen on the posterior part of the mesonotum and on a large presutural spot much darker and more reddish. Pleura entirely black, with pale greyish yellow pollen, except that on the mesopleura there is a large spot of reddish brown pollen.

*Legs:* the femora entirely black, hind tibiae and tarsi black, the anterior and middle tibiae very dark brown with the base obscurely reddish brown. The tarsi dorsally are also extremely dark brown. Pile of legs pale brownish yellow, with all of the bristles similarly colored. Claws reddish brown at the base.

*Wings:* tinged with pale brown. Lower end vein of the discal cell nearly three times as long as the upper vein (discal cross vein) and forming a low angle with the end vein of the fourth posterior cell. Veins quite dark brown, only the prehumeral veins orange brown.

*Abdomen:* black, the lateral margins widely greyish white pollinose and all bristles pale. Terminalia black, elongate, the superior forceps with a long and apically attenuate process and the ventral plate with a pair of flat processes which are triangular when viewed from the rear, but thin and sharply pointed when viewed from the side.

Female. The female is quite similar to the male. As in the male, the pleura are black with thick overlay of greyish white pollen and a large reddish brown spot of pollen on the mesopleura. The principal difference lies in the tibiae, where the basal third is quite pale and rather yellowish and conspicuously, though diffusely, in contrast to the remainder of the tibiae.

*Type* male, and *allotype* female: 37 miles southeast of Perth, Brookton Highway, WEST AUSTRALIA, 6, 1, 1954, F. M. Hull, collector.

**Bathypogon robustus** n. sp.

A large species. Related to *asiliformis* Loew but without sharp needle-like processes on the terminalia. Characterized by the black antennae, the pale bristles of the face, with the face tending to be reddish ventrally. The mesonotum is everywhere black in ground color, except the humeri, which are reddish. Pleura widely reddish in ground color on the posterior part. All femora with complete black dorsal and anterior black stripes, but otherwise light reddish in color. Length 20–23 mm.

Male. *Head:* front and vertex and the upper half or more of the face and the cheeks black in ground color. Face ventrally more or less reddish. Proboscis and palpi black. The antennae are black. The base of the first segment ventrally and laterally is reddish, the apex of the second, and the base of the third segment dark brown laterally. All bristles and pile of head and antennae are quite pale brownish yellow. The middle of the face has numerous, long, moderately stout bristles extending over the lower five-sixths of face. The face is gently elevated shortly below the antennae.

*Thorax:* mesonotum black in ground color. Viewed from above, the pollen is dark olive brown, with an indistinct pair of narrowly separated darker vittae. Lateral pollen of mesonotum including that of the humeri light brownish yellow and similar pollen continued over the pleura. The propleura, sternopleura, lower metapleura and the anterior mesopleura are nearly black in ground color, the remainder light reddish brown. The complement of mesonotal bristles, all of which are long and stout, consists of one posthumeral, two or rarely three notopleurals; one supra-alar, two or rarely three postcalli, and two pairs of scutellars.

*Legs:* femora light brownish red posteriorly on the first four, and medially on the hind pair; the remainder are uniformly

black from base to apex. The anterior tibiae are light reddish, except narrowly at the apex, which is brownish black; the black color extends medially to the middle of the tibiae. Middle tibiae reddish with only the apex dark brown. Hind tibiae reddish wit hthe lateral surface blackish from middle to apex. All tarsi brownish black dorsally. Pile and bristles of legs quite pale brownish yellow, the middle of the ventral surfaces of the tarsi with some dark brown bristles and also some golden setae. Claws light brown at base and comparatively blunt, without being obtuse.

*Wings:* nearly hyaline, with a reddish brown tint imparted chiefly marginally and distally. Lower end vein of discal cell and fourth posterior cell aligned.

*Abdomen:* brownish black in ground color, changing to reddish brown laterally and likewise along the lateral posterior margin, and more narrowly along the basal margins of the segments. The pollen is light brownish yellow, except in an oblique light. Viewed directly above, the tergites have a dark brown appearance with interrupted, posterior, yellow, pollinose margin. Superior forceps black, the posteroventral margin, the apex, the dorsal margin and the medial basal area of the ventral plate diffusely dark reddish brown. These terminalia are without conspicuous protruding processes of any kind.

*Type* male, and *allotype* female (in copula): Canberra, A. C. T., 20–30, XI, 1953, F. M. Hull collector. *Paratypes:* 43 males and 53 females, all collected at Canberra from November 20 to December 10, 1953.

# On Opius ferrugineus Gahan and Two Closely Similar New Species (Hymenoptera: Braconidae)

By C. F. W. Muesebeck, United States National Museum

*Opius ferrugineus* Gahan has long been known as a parasite of the cherry fruit fly of the eastern states, *Rhagoletis cingulata cingulata* (Loew). More recently specimens of an *Opius* have been reared abundantly from the western race of the cherry fruit fly, *R. c. indifferens* Curran, which were at first identified as *ferrugineus* and later as a new subspecies of *ferrugineus*. Now, after further study of more material, it seems to me that this western form is best treated as a distinct species. Although exceedingly like *ferrugineus* it exhibits certain rather constant differences and, furthermore, it seems to breed only parthenogenetically whereas *ferrugineus* is a normal bisexual species. A second eastern species, which parasitizes the apple maggot and the blueberry maggot, *Rhagoletis pomonellae* (Walsh), has also been identified as *Opius ferrugineus* in the past but is likewise distinguishable. The three species may be identified by means of the following key.

1. First tergite smooth before posterior margin, the median longitudinal embossed area flattening out on apical third where the delimiting keels disappear; antennae 33- to 38-segmented, usually 34- to 36-segmented. Apparently breeding only parthenogenetically, no males having been reared. Western U. S. ..... *muliebris*, new species

   First tergite rugose apically, especially on the median longitudinal embossed area, which does not flatten out on apical third but is distinct to apex of tergite, its delimiting keels complete or virtually so; antennae 34- to 47-segmented, usually with at least 38 segments. Bisexual species. Eastern U. S. ..... 2.

2. Antennae usually 38- to 42-segmented; metapleuron smooth and polished on anterior half; ovipositor sheath definitely shorter than the body ..... *ferrugineus* Gahan

   Antennae usually 43- to 47-segmented; metapleuron entirely rugulose; ovipositor sheath fully as long as head, thorax and abdomen combined ..... *alloeus*, new species

**Opius muliebris,** new species

Distinguished from *ferrugineus* and *alloeus* as shown in the foregoing key.

*Female.*—Length about 3 mm. Head about as broad as thorax; face twice as broad as long, smooth and shining, with only a few faint punctures laterally; clypeus polished, impunctate; a large transverse opening between clypeus and mandibles; malar space shorter than basal width of mandible; temples receding slightly; antennae 33- to 38-segmented.

Mesoscutum smooth and polished and with a median dimple-like impression posteriorly; notaulices sharply impressed anteriorly but vanishing before middle of scutum, smooth; prescutellar sulcus usually composed of four large foveae, which are, however, further divided in some specimens; scutellum polished; propodeum regulose; mesopleuron smooth, with a longitudinal foveolate furrow; metapleuron smooth basally, rugulose apically; second abscissa of radius and first intercubitus subequal; recurrent vein entering second cubital; postnervellus weak but distinct.

Abdomen in widest part as broad as thorax; first tergite with a deep basal impression which is bordered on each side by a prominent keel, these keels extending caudad but becoming gradually weaker and vanishing at apical third of tergite; the embossed area between the keels irregularly punctate behind the basal impression but flattening out and smooth on apical third of the tergite; second and following tergites smooth and polished; ovipositor sheath about as long as abdomen and propodeum combined.

Honey yellow; stemmaticum black; antenna black, scape testaceous at base and below; wings hyaline, stigma and veins brown; legs concolorous with body; apical segment of each fore and middle tarsus, the hind tibiae more or less, and the hind tarsi entirely, fuscous to blackish.

*Male.*—Unknown; apparently non-existent.

*Type.*—U. S. National Museum No. 63134.

*Type-locality.*—Ten miles north of White Salmon, WASHINGTON.

Described from 112 females reared from *Rhagoletis c. indifferens* Curran in July and August 1954, by Kenneth E. Frick. Other specimens, totaling 147 females, have been examined in connection with this study. These include other series reared from *R. c. indifferens* in Washington and Oregon, some specimens from *Rhagoletis* on *Prunus emarginata,* Placer Co., California, and others labeled "from wild cherry fruit fly pupae, Belknap Spgs., Ore."

**Opius ferrugineus** Gahan

*Opius ferrugineau* Gahan, 1915. Proc. U. S. Nat. Mus. 49: 69, 75.

The holotype, an unusually small specimen, has the antennae 34-segmented and the allotype has them 39-segmented. In the remaining specimens with complete antennae that are in the National Museum collection the number of segments in the antennae ranges from 37 to 40 for females and from 39 to 43 for males. The ovipositor sheath is definitely shorter than that of *alloeus,* and about as long as, or indistinctly longer than, that of *muliebris.* The embossed area on the first tergite is sculptured to the apex though not so coarsely as in *alloeus,* and the keels bounding it are not nearly so prominent on the apical third. The metapleuron is sculptured like that of *muliebris.*

**Opius alloeus,** new species

Distinguished from *muliebris* especially by its longer antennae and by having the median longitudinal embossed area on first tergite strongly sculptured and sharply defined to the apex, and from *ferrugineus* as mentioned under that species.

*Female.*—Length about 4 mm. Face twice as broad as long, weakly but distinctly punctate, more completely so than in *muliebris;* clypeus with some punctures; a large transverse opening between clypeus and mandibles; temples receding slightly; malar space a little shorter than basal width of mandible; antennae 44- to 47-segmented in the available specimens.

Mesoscutum smooth and polished and with a median dimple-like impression posteriorly; notaulices sharply impressed, broad and foveolate in front, extending nearly to middle of scutum; prescutellar sulcus broad and deep, with four large foveae which are sometimes divided further; scutellum polished; propodeum completely coarsely rugose reticulate; mesopleuron smooth but with a coarsely foveolate longitudinal furrow; metapleuron finely rugulose; second abscissa of radius usually slightly longer than first intercubitus; recurrent vein entering second cubital cell at base; postnervellus distinct.

Abdomen in widest part about as wide as thorax; first tergite broadly excavated at base, the impression margined laterally by prominent keels that converge to the middle of the tergite and then continue strong and nearly parallel to posterior margin; the median longitudinal embossed area, which begins behind the basal impression and is bounded by the two strong keels, longitudinally rugulose to apex; second and following tergites smooth and polished; ovipositor sheath at least as long as head, thorax and abdomen combined.

Honey-yellow; stemmaticum black; antennae black with scape largely or entirely testaceous; wings hyaline, stigma and veins brown; legs concolorous with body, but the hind tibiae apically and the hind tarsi usually somewhat infuscated.

*Male.*—Essentially like the female. The antennae of the available specimens are 43- to 47-segmented.

*Type.*—U. S. National Museum No. 63135.

*Type-locality.*—Orono, MAINE.

Described from 4 females and 2 males reared from *Rhagoletis pomonella* (Walsh) at Orono, Maine, August 12, 1933; 3 females and one male from *R. pomonella,* Red Hook, N. Y., July 28, 1930, and 3 females and 6 males from the same host, reared at Wallingford, Conn. in 1922 by B. A. Porter. There are additional specimens in the National Museum labeled as having been reared from *Rhagoletis* at Jasper, Ascot and Tampa, Florida.

# A Simple Method for Artificially Feeding Blood Sucking Insects [1]

By Ellicott McConnell, Department of Entomology and Economic Zoology, University of Minnesota, St. Paul

Several devices have been described which are satisfactory for the *in vitro* feeding of liquids to positively thermotropic insects. The apparatus described in the present paper is a modification of the one used by Greenberg (1949), and has the advantage that it may be constructed from materials available in the average laboratory scrap pile.

The essential part of such a device is the heating unit. If electrically heated coils are used the units are usually made from glass, asbestos, or similar non-conductors. However, as the working temperature for this type of apparatus never exceeds the blood temperature of homoiotherms it is unnecessary to restrict construction to non-inflammable materials. Accordingly, the heating elements are made from ordinary cardboard mailing tubes in the following manner.

One end of a length of resistance wire is tied securely to a small nut or similar object and placed inside the mailing tube. The other end is led out through a short, longitudinal slit in the lip of the tube and clamped in a vise. When a strain is placed on the wire the nut butts up against the inside lip of the tube, permitting tension on the wire to be maintained. By holding the mailing tube slightly less than perpendicular to the wire and rotating it toward the vise a helical coil can be wound on that part of the tube covered by the top when it is in place (fig. 1–(7)). After a coil of the desired length has been wound on the tube the top is slipped over the coil into its normal position. Tension on the wire is maintained until the top is fully in place to prevent displacement of the coils. Next, the metal top of the tube is cut off as close to the end as possible. The end of the tube which does not contain the coil is cut off and discarded. When making the cut care should be taken not to sever the wire. If an ohmmeter is available a final check may be

[1] Paper No. 3503, Scientific Journal Series, Minnesota Agricultural Experiment Station, St. Paul 1, Minnesota.

made to be certain that none of the turns of wire has been displaced against another by the top of the tube.

The size of the mailing tubes which are used depends on the diameter of the feeding vials. For effective heat transfer the vials should fit snugly, but not so tightly as to damage the feeding membrane.

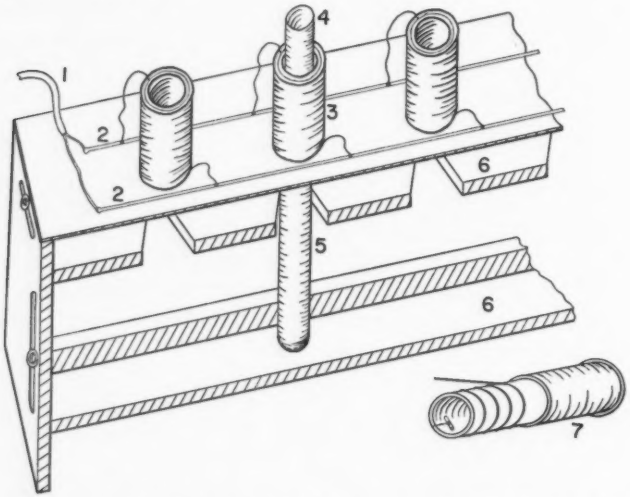



FIG. 1. Feeding apparatus. (1) To power supply; (2) Electric wiring; (3) Heating coil; (4) Feeding vial; (5) Insect container; (6) Adjustable supports; (7) Detail of coil construction.

The completed elements can be arranged in the way most convenient for a particular problem. One end of a bank of tubes used here is shown in the text figure. If a number of the units are to be connected in parallel it is necessary to use equal lengths of wire in the coils to prevent uneven heating. Any variable transformer capable of precise adjustment can be used for a power supply. In determining the proper setting to maintain a desired temperature it is important that a low initial setting be used. Otherwise, a sudden overload may melt any soldered connections, or ignite the cardboard mailing tubes.

In the present apparatus, which has mailing tubes of about one inch outside diameter and heating coils with a resistance of 30 ohms, a setting of 7.5 volts on a Powerstat transformer maintains a temperature of 37° C. in the feeding vials. If no variable transformer is available one can either make enough tubes to obtain the desired heat, determining the number needed by testing, or one can introduce standard resistances such as heavy duty room-heating coils into the electrical line. But ease and versatility call for a variable transformer.

The body of the apparatus can be made from plywood or similar material. If the insects are to be kept in glass vials or test tubes it is convenient to include an adjustable rack as illustrated. For the feeding of mosquitoes in lantern globes an arrangement similar to that used by Greenberg is more desirable. As a final step a coat of shellac or varnish should be applied to the whole apparatus. This provides an easily cleaned surface, and prevents fraying or wetting of the cardboard heating cylinders.

LITERATURE CITED

GREENBERG, J. 1949. A method for artificially feeding mosquitoes. Mosquito News 9(2) : 48–50.

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## The Neotropic Acanthocinini (Coleoptera: Cerambycidae). II. A Further Note on Canidia Allies

By LAWRENCE S. DILLON, Department of Biology, A. & M. College of Texas, College Station, Texas

Since the genera related to *Canidia* have been reviewed,[1] a new form has been encountered in a miscellaneous assortment received from the California Academy of Sciences. The author expresses his gratitude to Dr. Hugh B. Leech for the privilege of studying these specimens.

[1] Ent. News, LXVI, 1955, pp. 141–149, 176–187.

**Pseudocanidia ochreosticticus** Dillon, new species

Male. Dark reddish brown, head, humeral region of elytra, and pro- and metafemora piceous; rather sparsely covered with cinereous pubescence; indistinctly mottled with brown or fuscous on body beneath, femora, tibiae, antennal scape, and sides of head. Head on vertex, on front, and narrowly behind eyes tinged with ochraceous. Pronotum broadly each side (especially above lateral tubercles, and even more pronouncedly anteriorly) and narrowly at middle on apical half, vittate with ochraceous. Elytra rather densely sprinkled with fine, vague, ochraceous maculae, maculae nearly wanting from a large area on disk extending from basal third to apical fourth. Antennae sparsely hoary pubescent, segments from third broadly annulate with dark brown apically and from fifth narrowly semi-annulate basally with the same color.

Very similar to *P. cuernavacae* Dillon in structure except as follows: eye with lower lobe more than one-third again as tall as gena. Pronotum with sides gradually tapering anteriorly from lateral tubercles, which are low, and armed with a relatively short, robust spine which is scarcely directed backwards; disk with tubercles feebly elevated, the two anterior ones appearing more as callosities, the median more prominent, elongate, punctation moderately coarse, quite sparse. Elytra with basal gibbosity similarly low and broad, but not provided with a crest or with tubercles; punctation as a whole rather dense, becoming denser behind basal third, punctures scarcely finer apically; carinae obsolete; apices nearly squarely truncate, the angles strongly rounded. Antennae about one-fifth longer than body, beneath with a few long setae; scape beneath distinctly compressed, with a single prominent carina which runs to the middle of the long, rounded, apical process, above and laterally on apical half broadly sulcate; third segment one-ninth longer than first, arcuate; rest gradually, rather strongly diminishing in length.

Length, 10.6 mm.; width, 2.8 mm.

*Holotype:* Male; Tancitaro, Michoacan, Mexico, July 22, 1940 (Hoogstraal expedition) [CAS].

Remarks: Besides the very different coloration of the body above and of the antennae, this species is distinct from *cuernavacae* in the structure of the scape. On this organ the apical process is quite elongate, but the chief differences lie in the pronounced carina of its underside and in the two broad, elongated impressions, one of which is dorsal and mesial in location, the other being laterad of the carina. Moreover, the pronotal sculpturing is quite distinct, the discal tubercles being much lower, the median one elongate, and the lateral tubercles are likewise poorly elevated and armed with much shorter, scarcely retrorse spine.

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## Entomological Departments

Believing such material to be of interest to its readers, ENTOMOLOGICAL NEWS herewith solicits articles similar to the one here presented and giving information on the organization and activities of entomologists in colleges, universities, museums, and in government and other groups.

### University of Connecticut

Entomological work at the University of Connecticut is organized as an integral part of the Department of Zoology, Entomology and Biochemistry. This integration of activities is consistent with the university policy of training broadly in the fundamental concepts of biological investigation.

The University is located in the community of Storrs approximately thirty miles east of Hartford, the state capital, ninety miles southwest of Boston and one hundred and fifty miles northeast of New York City. Thus the location combines the advantages of a school of nearly 10,000 students with a rural New England environment.

Entomology has been taught at the university for many years, producing many well known entomologists, but is very young as a graduate unit granting its first Ph.D.'s in Entomology in 1954. This growth of the department has coincided with the rapid growth of the University from a small college to its present size within the past decade.

The emphasis of the department organization is upon producing students broadly trained in entomology and allied disciplines. Major stress is given to physiology, histology, morphology, taxonomy, ecology and the more basic aspects of insect control.

Members of the staff directly concerned with entomological activity, their areas of teaching and research specialization are as follows:

R. M. DeCoursey, Ph.D. (Illinois). Head of Department.
Insect Bionomics: Immature stages of Hemiptera.
E. G. Boettiger, Ph.D. (Harvard). Physiology.
Physiology of Insect Flight.
N. T. Davis, Ph.D. (Wisconsin). Insect Morphology.
Morphology and physiology of reproductive organs of Hemiptera.
L. R. Penner, Ph.D. (Minnesota). Parasitology.
Helminthology and Medical Entomology.
E. L. Schmidt, Ph.D. (Harvard). Histology.
Histology and physiology of insect connective and glandular tissues.
J. A. Slater, Ph.D. (Iowa State). Taxonomy; General Economic Entomology.
Systematics and biology of Hemiptera.
J. Manter (Professor Emeritus). Economic Entomology.
W. Tunis—Extension Entomologist: College of Agriculture.

Cooperating closely with the formal teaching staff, and serving on graduate committees, are the members of the Connecticut Experiment Station and the Northeastern Forest Insect Laboratory at New Haven. As a result of this cooperation graduate programs can be offered that provide opportunities for research in a wide variety of fields. The Connecticut Experiment Station staff in Entomology is headed by Mr. Neely Turner and the Forest Insect Laboratory by Mr. Philip Dowden. These active organizations will presumably be discussed in this journal in future issues.

Departmental facilities are generally adequate for research work in a variety of fields although space and facilities are somewhat limited at present due to the recent organization of

the present program and the rapid general growth of the entire university program.

The departmental insect collection consists of in the neighborhood of 50,000 to 75,000 specimens and at present is in a state of active growth and expansion. It is perhaps strongest in the Hemiptera which have within the past few months been augmented by the purchase of the C. O. Esselbaugh collection of Pentatomidae. Included in the material is part of the Schroeter collection of Lepidoptera, the Love collection and parts of the Hart neotropical material. Systematic and faunistic work is encouraged and students properly qualified have access to the collections at all times. Because of the rural setting of the university a very wide variety of fine habitats is available in the immediate vicinity for ecological studies and collecting.

The department maintains a small greenhouse, animal and rearing rooms and has use of adjacent orchards and experimental field plots.

The physical location of the university offers staff and students the opportunity to utilize the definitive collections and facilities available at such centers as the Museum of Comparative Zoology, the American Museum of Natural History and other important eastern centers.

Departmental assistantships are limited in number but are available to qualified students from time to time and other opportunities for employment are frequently available.

The relationship with the Connecticut Experiment Station and the Forect Insect Laboratory has in the past offered opportunity for summer employment and the chance to obtain valuable field experience in the applied aspects of entomological activity.

We should like to present ourselves to the entomological audience as a relatively new department with both the advantages and disadvantages inherent in such a condition, and with the objective of producing basic scientific work and training in entomology as the best method of contributing to the continued growth of our discipline.—JAMES A. SLATER.

## Notes and News in Entomology

Under this heading we present from time to time, notes, news, and comments. Contributions from readers are earnestly solicited and will be acknowledged when used.

### Corresponding Members of the A. E. S.

Almost one-hundred years ago, in March, 1859, the Baron OSTEN SACKEN, a visitor at one of the early meetings of the American Entomological Society, was elected as the first *Correspondent* of the Society. In 1862, when the Society was incorporated under the Laws of the State of Pennsylvania, its Charter provided for a class of Corresponding Members as well as for Resident Members. Since then, down through the years, outstanding entomologists from all parts of the world have, from time to time, been elected as Correspondents, and have each received an engrossed diploma, and a life-time subscription to the "Transactions" of the Society. The present list of Correspondents is as follows:

C. P. Alexander, Amherst
G. Arnold, S. Rhodesia
J. C. Bequaert, Cambridge, Mass.
T. Borgmeier, R. de Janeiro
Annette F. Braun, Cincinnati
L. Chopard, Paris
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J. A. Comstock, Los Angeles
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J. G. Needham, Ithaca
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H. Schouteden, Belgium
H. F. Schwartz, New York
R. E. Snodgrass, Washington
P. H. Timberlake, Riverside
B. Uvarov, London
E. M. Walker, Toronto
H. Weber, Tübingen
V. B. Wigglesworth, Cambridge
F. Zeuner, London.

## Society Meeting

At its meeting February 23 the AMERICAN ENTOMOLOGICAL SOCIETY had as its guest speaker Dr. DALE W. JENKINS, Entomology Branch, Camp Dietrich, Frederick, Maryland. Dr. Jenkins' subject was "Atomic Radiation and Entomology." In his interesting talk the speaker mentioned the use of radioisotopes in insect biology as a technique used in studies of physiology, distribution, ecology and control. He also discussed his experiences as a U. S. delegate to the recent "Atoms for Peace" conference held at Geneva, Switzerland. A discussion period followed the talk.

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## Tenth International Congress of Entomology

The second circular for the Congress, which will be held at Montreal, Canada, this summer, has been issued by its Secretary, Mr. J. A. DOWNES, Science Service Building, Ottawa, Ontario, Canada. It consists of 67 pages and gives a detailed account of the arrangements that have been made, including a preliminary program of section meetings and symposia. Applications for membership, a description of the excursions and tours, and applications for accommodations are also provided. These applications, as well as applications for presenting papers should be sent in by April 30th.

The Registration Office at McGill University will open Thursday, August 16. The opening session on the afternoon of August 17, and the section meetings on Aug. 18 and 20, will also be at McGill University. The meetings of Aug. 22 to 25 inclusive will be at the University of Montreal. Sunday, Aug. 19 is reserved for excursions, including one to Quebec, and Tues., Aug. 21 for an excursion to Ottawa.

After the close of the meetings there is a choice of various excursions and tours for collecting, and for visiting entomological institutions. These require from four days to three weeks, the most extended one going to western Canada and as far as Victoria.

# EXCHANGES

**This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.**

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

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**Conopidae** of the World wanted. Will pay 10¢ to $1.00 for pinned and labelled specimens. S. Camras, 4407 N. Milwaukee Ave., Chicago 30, Illinois.

**Anisoptera**—Nearctic sp. wanted for exchange, espec. Ophiog., Arigom., Aeschna, Neurocor., Somatoc., Cordulia, Dorocor., Leucor. R. D. Cuyler, Dept. of Entomology, N. C. State College, Raleign, N. C.

**Bembicini and Stizini** (Hym., Sphec.) of New World wanted for revis. study. Will return upon request or at end of project. James E. Gillaspy, Dept. of Zoology, Univ. Texas, Austin 12, Texas.

**Agapema galbina.** Will exchange cocoons of this moth for nature books. E. Frizzell, Route 4, Box 96, San Benito, Texas.

**Wanted**—Data on exact location of colonies of *Epibembex* (olim *Bembix*) (Hymenoptera), any species, any part of country, for biological studies. Howard E. Evans, Dept. Entomology, Cornell Univ., Ithaca, N. Y.

**Fanniinae** wanted on loan (nearctic and holarctic), and information on collections. James G. Chillcott, Dept. Entom., Univ. of Kansas, Lawrence, Kan. (Loans may be charged to Dr. C. D. Michener.)

**Tenebrionidae** of the World wanted, in exchange for insects of Argentina and neighboring countries. Horacio J. Molinari, Av. Lib. Gral. San Martin 55, Acassuso (Buenos Aires), Rep. Argentina.

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